

Yellow birch

(*Betula alleghaniensis*)



Yellow birch is a **slow-growing, shade tolerant** species, found mainly in northern Wisconsin. The volume of yellow birch has increased 34% since 1983 but remained largely unchanged in the last decade. The number of seedlings has decreased since 1996 but the number of larger trees has increased.

The ratio of **growth to volume** is **below average** for all species and the ratio of **mortality to growth** is **above average**.

Yellow birch is **not an important timber species**, accounting for only 1% of roundwood production, mainly pulpwood. The density of yellow birch wood is very high making it a possibly valuable species for biomass production although there is not much volume.

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“How has the yellow birch resource changed?”

Growing stock volume and diameter class distribution by year

The [growing stock volume](#) of yellow birch in Wisconsin in 2008 was approximately 279 million cft or about 1.3% of total statewide volume (Chart 1). This represents an increase of about 34% since 1983 but **remained statistically unchanged in the last decade**.

The yellow birch resource is aging as volume in large trees (over 13 inches diameter) has increased more than volume in small trees since 1996, 13% compared to only 2% (Chart 2).

The number of [seedlings](#) decreased over 40% between 1996 and 2008, but the number of larger trees increased by 11% (Chart 3).

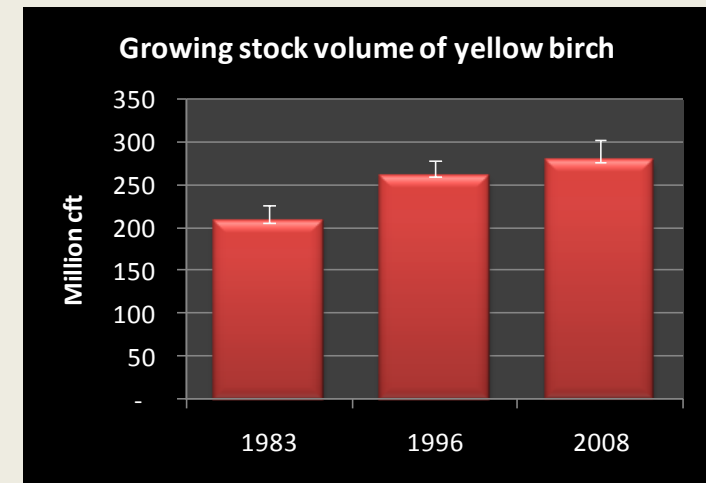


Chart 1. Growing stock volume (million cubic feet) by inventory year.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

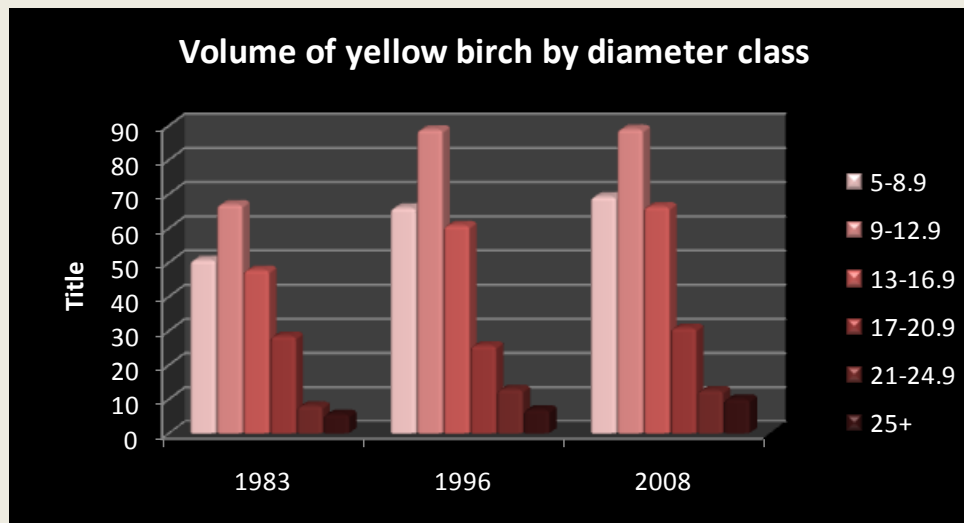


Chart 2. Growing stock volume (million cubic feet) in 1983, 1996, and 2008.
Source: USDA Forest Inventory and Analysis data: 1983, 1996, and 2008.

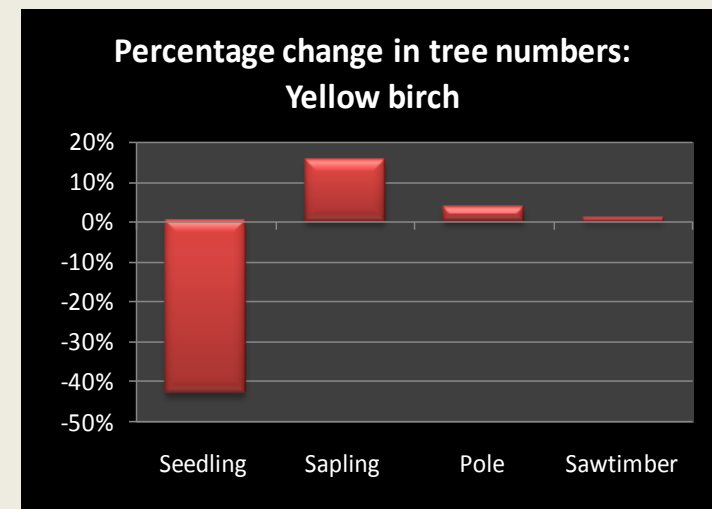
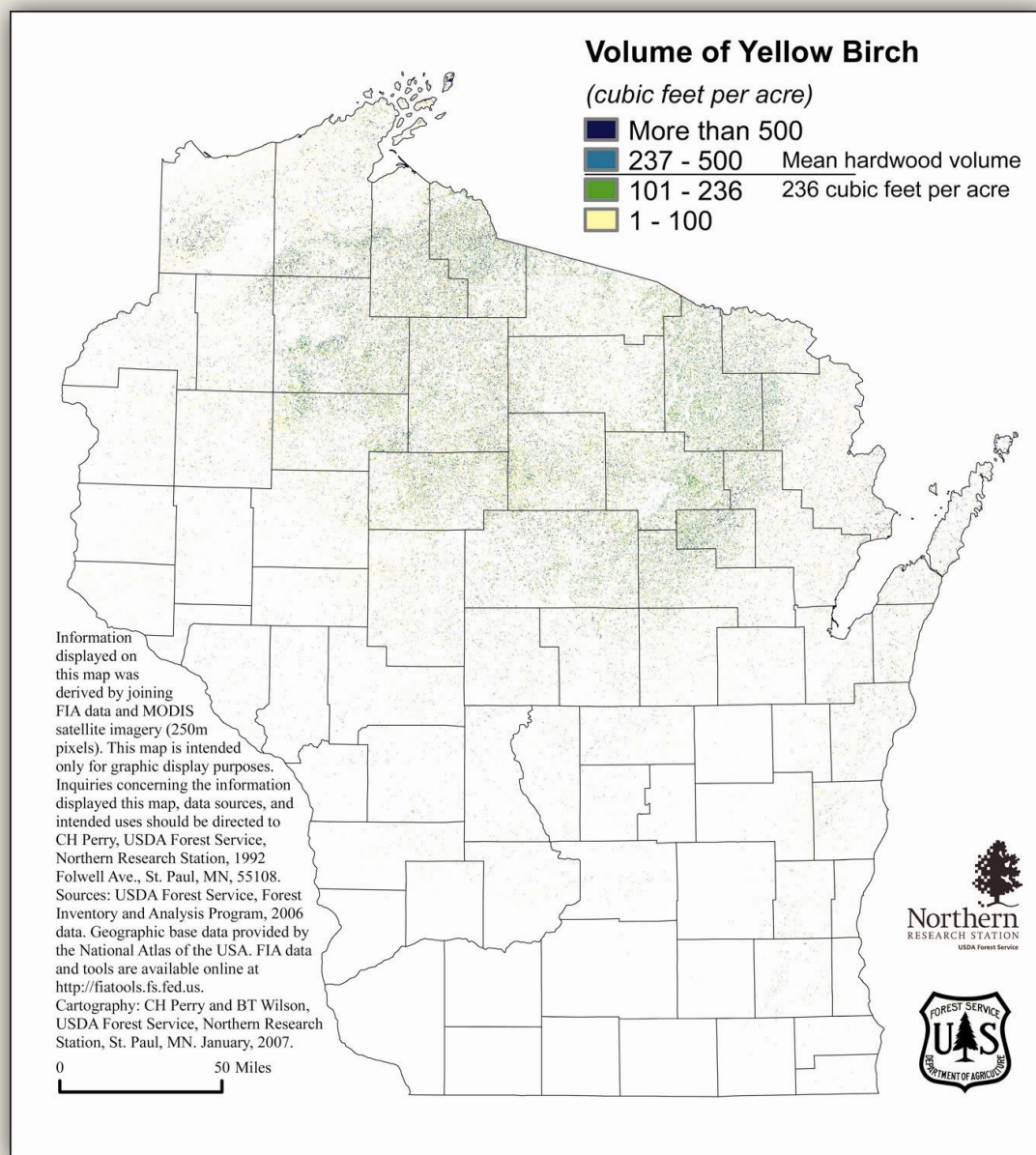


Chart 3. Percentage change in the number of live trees by size class between 1996 and 2008.
Source: USDA Forest Inventory and Analysis data 1996, and 2008.

"Where does yellow birch grow in Wisconsin?"

Growing stock volume by region with map



Yellow birch occurs mainly in northern Wisconsin with 87% of total volume in the northeast and northwest regions (Table 1).

In the north, the vast majority of yellow birch occurs on maple basswood [forest type](#). In the south, it can also occur on bottomland hardwood types.

Table 1. Growing stock volume (million cft) by species and region

Species	Central	North east	North west	South east	South west	Total
Yellow birch	25	104	139	10	1	279
Percent of total	9%	37%	50%	4%	1%	100%

Source: USDA Forest Service, Forest Inventory and Analysis 2008 data

Additional tables:

Volume by county in 2008 ([pdf](#); [Excel](#))



"How fast is yellow birch growing?"

Average annual net growth by region and year

Average annual net growth of yellow birch was about 3.3 million cft/yr in 2004-2008 (Chart 4), which represents less than 1% of statewide volume growth. Growth rates have increased since 1996, but, due to high statistical error, it is difficult to determine by how much.

Table 2. Average annual net growth (million cft/year) and ratio of growth to volume by region of the state.

Region	Net growth	% of Total	Ratio of growth to volume
Central	0.6	18%	2.4%
Northeast	1.2	37%	1.2%
Northwest	1.5	46%	1.1%
Southeast	-0.1	-2%	-0.6%
Southwest	0.0	1%	2.1%
Statewide	3.3	100%	1.2%

Source: USDA Forest Inventory and Analysis 2008

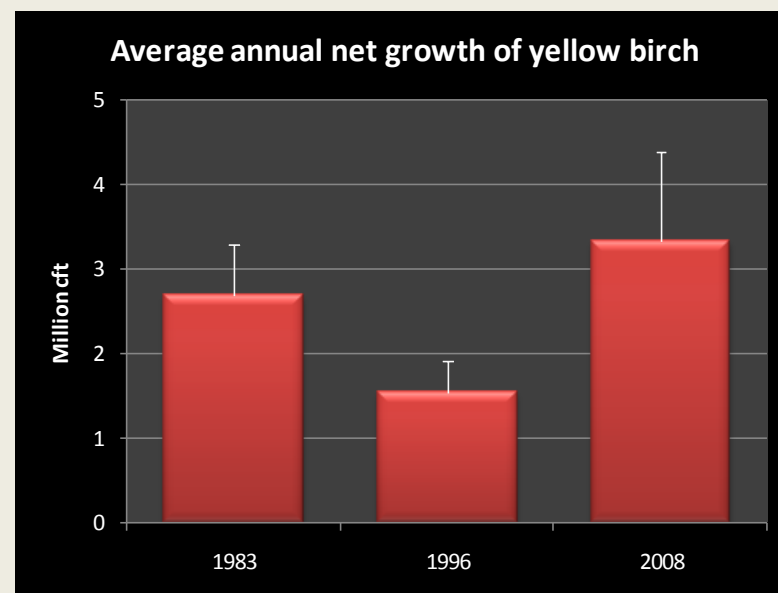


Chart 4. Average annual net growth (million cubic feet).

Source: USDA Forest Inventory & Analysis data: 1983, 1996, 2008

The highest volume growth for yellow birch is in the northern part of the state but the highest rates of net growth to volume are in central and southwest Wisconsin (Table 2). The average ratio of net growth to volume is 1.2%, much lower than the statewide average of 2.8% for all species.

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How healthy is yellow birch in Wisconsin?"

Average annual mortality: 1983, 1996, and 2008

Average annual mortality of yellow birch, about 2.2 million cft per year in 2004-2008, has remained statistically unchanged since 1983 (Chart 5). This represents about 1% of total statewide mortality.

The ratio of mortality to gross growth is 40% for yellow birch, much higher than the statewide average of 25.8% for all species (Table 3). This is mainly a function of a lower growth rate.

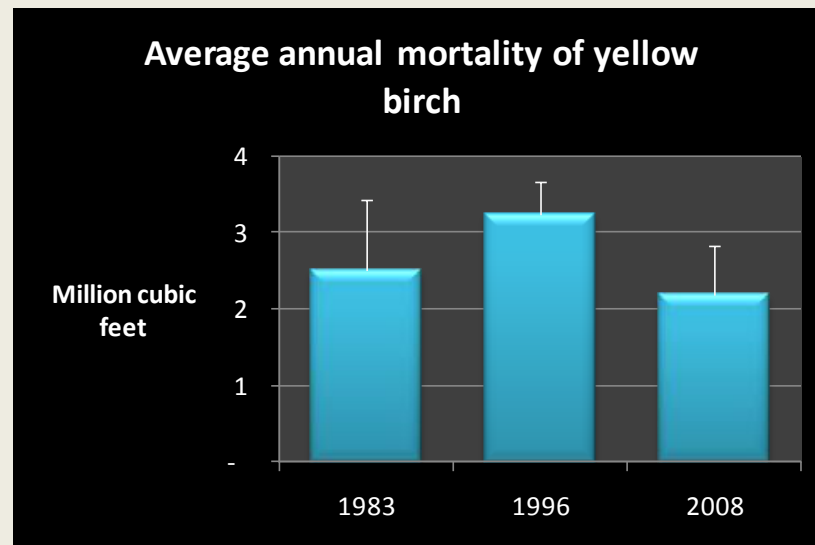


Chart 5. Average annual mortality (million cubic feet) by inventory year.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008

Table 3. Mortality, gross growth, and the ratio of mortality to gross growth.

Species	Average annual mortality (cft)	Average annual gross growth (cft)	Mortality / growth
Yellow birch	2,188,872	5,522,403	40%

Source: USDA Forest Inventory & Analysis data: 2008

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How much yellow birch do we harvest?"

Roundwood production by product and year: 1997, 2002, and 2008

In 2003, yellow birch accounted for 4.2 million cft or about 1% of Wisconsin's total [roundwood](#), about $\frac{2}{3}$ in pulpwood and $\frac{1}{3}$ in sawlogs and fuelwood (Chart 6).

From 2003 to 2006, pulpwood production decreased by 1.6 million cft or 58%. Yellow birch supplies 1.1 million cft or less than 1% of total pulpwood production.

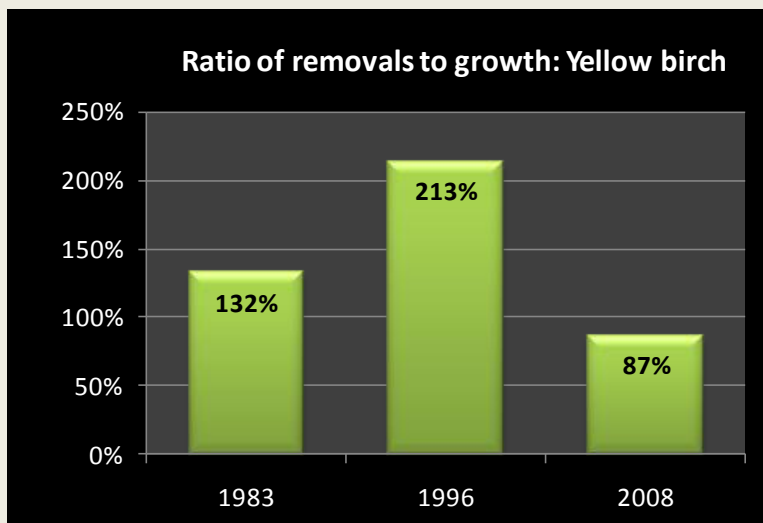
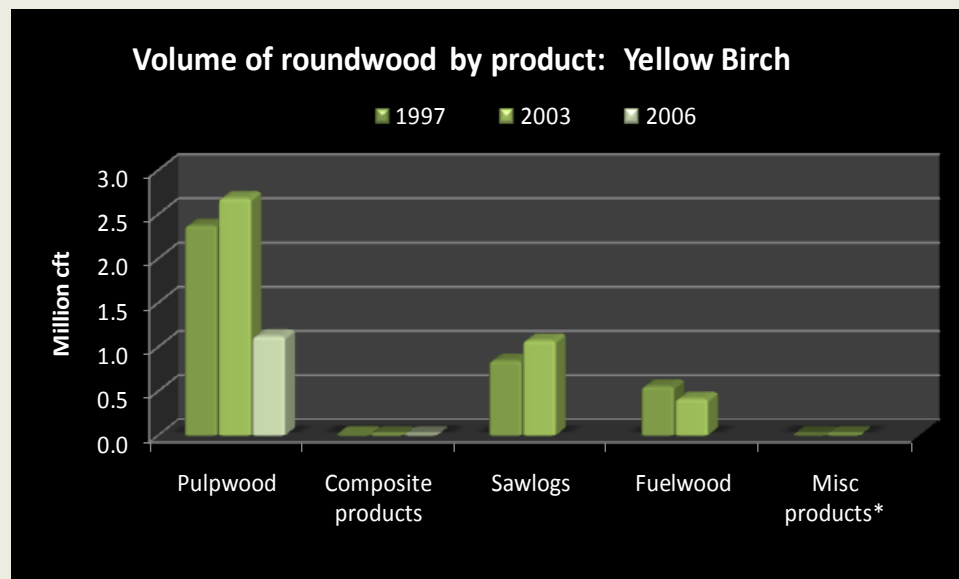


Chart 7. Ratio of volume harvested annually to net growth.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008.



*Miscellaneous products include posts and pilings and veneer.

Source: Timber Products Output Mapmaker, http://ncrs2.fs.fed.us/4801/fiadb/rpa_tpo/wc_rpa_tpo.ASP

The ratio of removals to growth peaked in 1996 and has fallen since then. This is probably due to a major increase in growth rates for yellow birch plus a fairly constant level of harvest. However, due to high statistical error, it's difficult to draw accurate conclusions.

Additional tables:

Average annual growth, mortality and removals by region ([Pdf](#), [Excel](#)).



"How much is yellow birch selling for?"

Prices for cordwood & sawtimber: 2000 to present

Due to the variability of timber prices from year to year and region to region, two methods of reporting prices are presented here: [Timber Mart North](#) and [weighted average stumpage prices](#) from Wisconsin Administrative Code Chapter NR 46.

Stumpage prices for sawtimber, as reported in the Timber Mart North (Chart 8), have been quite variable.

Average weighted stumpage values for sawlogs, as reported in NR46 (Table 4), peaked in 2006 and have declined since. Log prices are currently lower than the average for all hardwoods.



Chart 8. Average prices for cordwood and sawtimber (2007).

Source: Timber Mart North, George Banzhaf & Company, 8301 N. Allen Lane, Milwaukee, WI 53217

Table 4. Average weighted stumpage prices (adjusted for inflation to 2009 dollars) by year for Wisconsin.

Product	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	Average for all hardwoods
Cordwood (per cord)	\$21	\$23	\$20	\$18	\$19	\$20	NA	NA	NA	\$23	\$19
Logs (per MBF scribner)	\$252	\$201	\$213	\$199	\$294	\$268	\$366	\$154	\$196	\$117	\$140

Source: Wisconsin Administrative Code Chapter NR46, 2000 to 2009



"How much yellow birch biomass do we have?"

Oven-dry tons by region of the state

There were 10.5 million oven-dry tons (ODT) of yellow birch biomass in 2008, a decrease of 1.3 million ODT or 11%, from 1996. This species represents only 1.8% of all live biomass statewide. As with volume, most yellow birch biomass is located in northern Wisconsin (Chart 9).

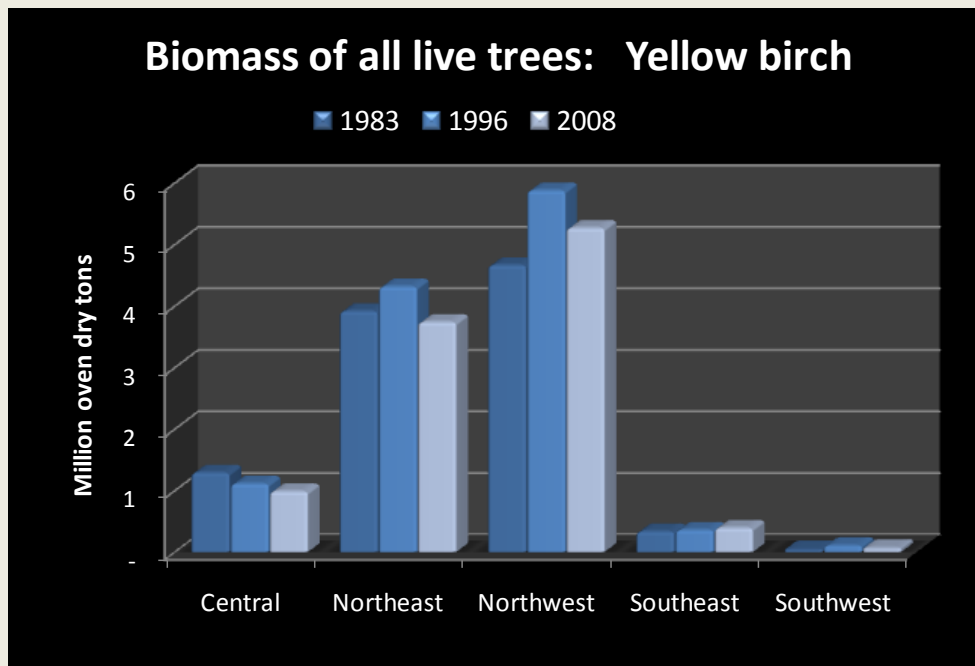


Chart 9. Biomass (million oven-dry tons) by year and region.
Source: USDA Forest Inventory & Analysis data: 1983, 1996, and 2008

The density of yellow birch wood is higher than average with a ratio of biomass to volume of 56.7 oven-dry lbs. per cubic foot (ODP/cft). The average for all hardwoods is about 50.1 ODP/cft and for all species is 46.8 ODP/cft.

Approximately, 74.5% of all yellow birch above ground biomass is located in the main stem and 21% in the top branches.

Additional tables:

Biomass by county in 2008 ([pdf](#), [Excel](#))